BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

In the Matter of	)	
AT&T Inc., Cellco Partnership d/b/a Verizon Wireless, Grain Spectrum, LLC, and Grain Spectrum II, LLC Seek FCC Consent to the Assignment of Advanced Wireless Services and Lower 700 MHz Band B Block Licenses and to Long-Term *De Facto* Transfer Spectrum Leasing Arrangements Involving Advanced Wireless Services and Lower 700 MHz Band B Block Licenses	)	**WT Docket No. 13-56**

RESPONSE OF AT&T INC. TO
GENERAL INFORMATION REQUEST DATED JUNE 13, 2013

June 25, 2013

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Introduction

AT&T Inc. ("AT&T") provides this response (the "Response") to the letter dated June 13, 2013, from Ruth Milkman, Chief of the Wireless Telecommunications Bureau of the Federal Communications Commission (the "FCC" or the "Commission"), and the General Information Request for AT&T attached thereto (collectively, the "Request"). In five requests (individually referred to herein as "Request No. [#]"), the FCC asks AT&T (sometimes referred to in the Request as the "Company," as defined therein) to provide by June 27, 2013, documents, data, and other information to complete the FCC's review of the applications of AT&T, Cellco Partnership d/b/a Verizon Wireless ("Verizon Wireless"), Grain Spectrum, LLC, and Grain Spectrum II, LLC for consent to assign certain licenses and grant long-term *de facto* transfer spectrum leasing arrangements.

Consistent with AT&T's discussions with the Commission staff, AT&T's responses are based on a review of available documents that are likely to contain responsive information and inquiry of those individuals and available sources that are likely to have relevant information. In certain cases, AT&T does not maintain some of the information requested in the ordinary course of business, or AT&T does not maintain the information in the precise manner requested. When information was not available for the period of time requested or in the form requested, AT&T has provided the information to the extent possible.

Where the Request seeks charts, spreadsheets, or similar graphic or tabular information,

or specific documents, responsive information is provided in exhibits to the Response, numbered with reference to the specific request (*e.g.*, Exhibit 1 responds to Request No. 1). Where the Request seeks documents, responsive documents are produced.

The Request calls for AT&T to submit certain information and documents that are sensitive from a commercial, competitive, and financial perspective, and that AT&T would not reveal in the ordinary course of business to the public or its competitors. AT&T is submitting information and documents on a Confidential and Highly Confidential basis pursuant to the Protective Order and Second Protective Order for this proceeding that were issued on June 13, 2013, and with respect to the Second Protective Order amended on June 25, 2013. The inadvertent inclusion of any material that is subject to an assertion of the attorney-client, attorney work-product, or other applicable privilege is not intended as a waiver of such privilege.

In the public version of the Response, AT&T has redacted Confidential Information and marked the redactions with "**[BEGIN AT&T CONFIDENTIAL INFORMATION]** . . . **[END AT&T CONFIDENTIAL INFORMATION]**". AT&T also has redacted Highly Confidential Information and marked the redactions with "**[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]** . . . **[END AT&T HIGHLY CONFIDENTIAL INFORMATION]**". The redacted Response is marked "**REDACTED – FOR PUBLIC INSPECTION**" and is being filed electronically in the Commission's Electronic Comment Filing System ("ECFS"). The Highly Confidential, unredacted Response is marked, "**HIGHLY CONFIDENTIAL INFORMATION – SUBJECT TO SECOND PROTECTIVE ORDER IN WT DOCKET NO. 13-56 BEFORE THE FEDERAL COMMUNICATIONS COMMISSION – ADDITIONAL COPYING RESTRICTED**" and is being delivered to the

Secretary. Additional copies of the unredacted Response are being delivered as instructed in the Request.

In accordance with the Request, the Protective Order, and the Second Protective Order, unredacted copies of Highly Confidential documents are marked "**HIGHLY CONFIDENTIAL INFORMATION – SUBJECT TO SECOND PROTECTIVE ORDER IN WT DOCKET NO. 13-56 BEFORE THE FEDERAL COMMUNICATIONS COMMISSION – ADDITIONAL COPYING RESTRICTED.**" Pursuant to the Request, the Highly Confidential documents are being delivered to Scott Patrick of the Wireless Telecommunications Bureau, while a redacted set of the documents is being filed electronically in ECFS.

Pursuant to discussions with the Commission staff, AT&T is submitting its Response consistent with the following qualifications:

- In the Request, AT&T interprets the term "relevant area" to mean each Cellular Market Area in the proposed transaction where AT&T is acquiring or leasing spectrum.

- AT&T has not verified that it has produced "all other documents referred to in the document or attachments," pursuant to Instruction 6.

- AT&T is not grouping materials being produced by the request number and, within each request-number grouping, by custodian, as requested in Instruction 10. The information being submitted as part of AT&T's Summation load should allow the Commission to sort the produced documents in this fashion, however.

RESPONSES

In the Public Interest Statement, AT&T noted that if the transactions were approved, AT&T would quickly put the 700 MHz B Block spectrum to use to benefit consumers, providing high-quality, high-speed wireless broadband, a result that would serve the public interest. Indeed, AT&T committed that it would deploy service within approximately 60-90 days in many relevant areas where AT&T already provides LTE service in the Lower 700 MHz C Block, representing approximately 80 percent of the total population in the CMAs where AT&T will acquire from Verizon Wireless or lease from Grain Spectrum, LLC the Lower 700 MHz B Block spectrum under the Proposed Transaction (the "Subject CMAs" and the "Subject Spectrum", respectively).[1] As described below, AT&T already has met this commitment. AT&T entered into short-term spectrum manager leases with Verizon Wireless pending the review of these transactions, which became effective on March 22, 2013. Since that time, consistent with its commitment, AT&T has deployed service over the leased spectrum in all of the CMAs covered by its commitment, covering approximately **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T HIGHLY CONFIDENTIAL INFORMATION]** POPs, including major population centers like Los Angeles, Chicago, Miami, Charlotte, Raleigh-Durham, West Palm Beach, and Oklahoma City.[2] In relevant areas where AT&T has not yet deployed service over the spectrum, AT&T has begun to plan its deployment and will launch service either as part of AT&T's initial LTE launch in those areas or after its initial launch to add

[1] Declaration of William Hogg ¶¶ 4-5 (filed Feb. 6, 2013).

[2] *See* the response to Request No. 4.a and Exhibit 1 for a complete list of the Subject CMAs in which AT&T has deployed the Lower 700 MHz B Block spectrum.

capacity to the LTE service.

1. REQUEST:

On page 1 of the Public Interest Statement, the Applicants assert that the spectrum transfers that would occur if the Proposed Transaction were approved would achieve "public interest benefits by putting spectrum to use to benefit consumers and help AT&T and Verizon Wireless provide high-quality, high-speed wireless broadband." For each relevant market, provide:

a. A detailed description of how the Company would use the spectrum that it would acquire under the Proposed Transaction to provide high-quality, high-speed wireless broadband to consumers, on a standalone basis and in conjunction with any other of the Company's spectrum holdings.

b. The Company's timeline for deploying the spectrum that it would acquire in the Proposed Transaction.

c. A detailed description of the Company's current and planned deployment of LTE and strategy for spectrum rationalization.

d. A discussion of the Company's plans to provide high-quality, high-speed wireless broadband services in the relevant markets prior to the Proposed Transaction. Provide any supporting material relied on in preparing the response.

e. All plans, analyses, and reports discussing, both prior to and after the consummation of the Proposed Transaction, (i.) the Company's plans to deploy its 700 MHz and AWS-1 and (ii.) efforts of other AWS-1 and 700 MHz licensees in deploying their spectrum.

RESPONSE:

This year and next, AT&T plans to deploy 4G wireless broadband services throughout its nationwide footprint, including covering approximately 300 million people nationwide with LTE service by the end of 2014.[3] As of June 2013, AT&T's LTE service covered **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T**

[3] In addition to 4G LTE, AT&T is deploying 4G HSPA+ service throughout its footprint using its cellular (850 MHz) and PCS (1900 MHz) spectrum, and plans to cover over 300 million people by the end of this year.

HIGHLY CONFIDENTIAL INFORMATION] people throughout the country, including approximately **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]** **[END AT&T HIGHLY CONFIDENTIAL INFORMATION]** people in the Subject CMAs. AT&T currently uses Lower 700 MHz B Block, Lower 700 MHz C Block, and AWS-1 spectrum to provide LTE services. As more customers upgrade to LTE service, and compatible handsets and equipment become available, AT&T expects to deploy LTE service using additional spectrum bands, including cellular, PCS, WCS, and Lower 700 MHz D and E Blocks.[4]

AT&T generally uses the following spectrum deployment strategy for its LTE services. **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]**

[END AT&T HIGHLY CONFIDENTIAL INFORMATION]

AT&T will use the Subject Spectrum to augment or fill in gaps in AT&T's LTE

[4] AT&T's ability to repurpose cellular and PCS spectrum for LTE services will depend on the need to continue to use that spectrum to support customers on the existing technologies for which the spectrum is being used.

deployment, resulting in faster, higher quality services to its customers in the Subject CMAs. Where AT&T holds only the Lower 700 MHz C Block spectrum (thus limiting AT&T's initial deployment to a 5x5 MHz configuration), the addition of the Subject Spectrum will allow AT&T to deploy LTE with a 10x10 MHz configuration. In the Subject CMAs where AT&T holds no Lower 700 MHz C block spectrum, the Subject Spectrum will be used for AT&T's initial LTE deployment or to augment AT&T's initial deployment of 5x5 MHz of AWS-1.

As indicated in the Public Interest Statement and the supporting declaration of William Hogg, AT&T planned to deploy the Subject Spectrum within approximately 60-90 days in markets where AT&T already provides LTE service in the Lower 700 MHz C Block, representing approximately 80 percent of the total population in the Subject CMAs.[5]

Accordingly, Verizon Wireless and AT&T entered into short-term spectrum manager leases for the Subject Spectrum and, on March 12, 2013, filed lease notifications with the FCC.[6] The short-term spectrum manager leases became effective on March 22, 2013. Since that time, consistent with the Public Interest Statement and Mr. Hogg's Declaration, AT&T has deployed the Subject Spectrum in 16 of the Subject CMAs, covering approximately **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T HIGHLY CONFIDENTIAL INFORMATION]** POPs, including major population centers like Los Angeles, Chicago, Miami, Charlotte, Raleigh-Durham, West Palm Beach, and Oklahoma City.[7] In areas where AT&T has not yet deployed the Subject Spectrum, AT&T will incorporate this

[5] Declaration of William Hogg ¶¶ 4-5 (filed Feb. 6, 2013).

[6] ULS File Nos. 0005688128, 0005688117 (filed Mar. 12, 2013).

[7] *See* the response to Request No. 4.a and Exhibit 1 for a complete list of the Subject CMAs in which AT&T has deployed the Lower 700 MHz B Block spectrum.

spectrum into its deployment plans either as part of AT&T's initial LTE launch or after the initial launch to add capacity to the LTE service.

Exhibits 1 and 5.6-5.9 provide detailed information regarding AT&T's current and planned LTE deployments in the Subject CMAs. In Exhibit 1, column C indicates whether the Proposed Transaction will result in AT&T holding or leasing contiguous Lower 700 MHz B and C Block spectrum; column D provides AT&T's LTE population coverage;[8] column E shows AT&T's forecasted LTE population coverage for year-end 2013;[9] and column F indicates the date when the Lower 700 B Block spectrum has been deployed or will be deployed, if the future date has been projected. In addition, Exhibits 5.6-5.9 show the amount of spectrum deployed by band for LTE service.[10]

The projections in Exhibit 1 related to AT&T's future LTE deployments, including deployment dates for the Lower 700 MHz B Block spectrum, represent AT&T's existing plans for LTE service in these areas. **[BEGIN AT&T HIGHLY CONFIDENTIAL]**

[8] **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]**

[END AT&T HIGHLY CONFIDENTIAL INFORMATION]

[9] The current and forecasted coverage data in Exhibit 1 may include "spillover" coverage from adjacent areas, potentially resulting in Subject CMAs showing population coverage although no LTE sites have been deployed within the CMA boundaries.

[10] *See* the response to Request No. 5.

[END AT&T HIGHLY CONFIDENTIAL] The deployment schedules and forecasted LTE coverage figures also may change due to a range of implementation factors, including changes in zoning, leasing, equipment vendors, and other factors.

AT&T is submitting documents relied upon to respond to Request No. 1.d. AT&T also is submitting documents responsive to Request No. 1.e.

2. REQUEST:

On page 2 of the Public Interest Statement, the Applicants contend that "[t]he assignments will allow AT&T and Verizon Wireless each to further rationalize their spectrum holdings and obtain contiguous spectrum in many markets, enabling more spectrally efficient deployments." Explain and describe in detail, including the period of time envisioned, how the Proposed Transaction would allow the Company to rationalize its spectrum holdings and deploy them more efficiently than it would without the spectrum that it would obtain if the Proposed Transaction were approved.

RESPONSE:

See the narrative response to Request No. 1 and Exhibit 1.

In addition, provide the following information:

a. Identify each relevant market where the Company would hold or lease contiguous spectrum as a result of the Proposed Transaction.

RESPONSE:

Column C of Exhibit 1 identifies the Subject CMAs where the Proposed Transaction would result in AT&T holding or leasing contiguous Lower 700 MHz B and C Block spectrum.

b. For each relevant market in which the Company would hold contiguous 12+12 megahertz paired spectrum as a result of the Proposed Transaction, provide the timeline for deploying the contiguous spectrum.

c. For each relevant market in which the Company would not hold contiguous spectrum as a result of the Proposed Transaction, provide the timeline for deploying the 700 MHz B Block spectrum it plans to acquire.

RESPONSE:

Column F of Exhibit 1 indicates AT&T's current and projected LTE deployment of Lower 700 MHz B Block in the Subject CMAs. See also the narrative response to Request No. 1, above.

d. Explain and describe in detail how contiguous spectrum enables more spectrally efficient deployments, including but not limited to, any analyses comparing the spectral efficiency, user performance, and capacity characteristics of a 5+5 megahertz LTE deployment with a 10+10 megahertz LTE deployment. Provide any supporting engineering data and documents relied on in preparing the response.

RESPONSE:

A 10x10 MHz deployment of contiguous Lower 700 MHz B and C Block spectrum would be more spectrally efficient than a deployment of two non-contiguous 5x5 MHz blocks. As discussed below, the 10x10 MHz deployment's wider bandwidth provides greater trunking efficiencies. Additionally, a 10x10 MHz contiguous block also benefits from signaling efficiency as many of the control overhead/messages (such as Physical Broadcast Control Channel, Shared Channel, *etc*.) need to be transmitted only once instead of twice, as would be the case for two non-contiguous 5x5 MHz blocks. These efficiency improvements result in higher system capacity and spectral efficiency and a better user throughput experience than would be possible over two separate 5x5 MHz blocks.

The wider bandwidth of a contiguous 10x10 MHz block provides trunking efficiency gain due to the pooling of the resources across a single scheduler, thus enabling AT&T to carry more traffic (more calls and more megabytes of data traffic per busy hour) than AT&T would be able to carry over two separate 5x5 MHz blocks. In other words, the increased efficiency results

from the fact that potential users can be scheduled over a larger number of resources (sub-channels) in the 10x10 MHz deployment than they can if they were split between two separate 5x5 blocks.[11] In addition, when the channel bandwidth is significantly greater than the coherence bandwidth[12] (the coherence bandwidth is generally somewhat less than 5 MHz in these systems), it ensures that the entire signal does not undergo a deep fade, and by using proper frequency-selective resource allocation, this should result in increased efficiency.

The relative gain in capacity from a 5x5 MHz to a 10x10 MHz deployment is nonlinear, meaning that the capacity of a 10x10 MHz block is greater than the total capacity of two separate 5x5 MHz blocks. For example, AT&T estimates that the average downlink capacity of a 10x10 MHz block, optimized for average user performance, is more than double — 2.2 times — the capacity of a 5x5 MHz block. Thus, the 10 MHz block would have approximately 10 percent more capacity than two 5 MHz blocks.[13] The wider bandwidth also results in noticeably better performance for users than a deployment using two 5x5 MHz blocks. For example, under multi-

[11] A useful analogy is to the ticket agent line at an airport. One line that is served by four ticket agents will provide more prompt and efficient service for customers than two separate lines, where each line is served by two ticket agents and customers cannot change lines. When one line is served by four ticket agents, whenever an agent is available, the next customer in line will be served. With two separate lines, if one line is empty and the other is full, the ticket agents serving the empty line are not utilized because customers cannot change lines. Combining the two lines results in better service to the customers as a whole, uses the ticket agents more efficiently, and provides the capacity to serve more customers in a given amount of time.

[12] "Coherence bandwidth is a statistical measure of the range of frequencies over which the channel can be considered 'flat' (i.e., a channel which passes all spectral components with approximately equal gain and linear phase). In other words, coherence bandwidth is the range of frequencies over which two frequency components have a strong potential for amplitude correlation." Theodore S. Rappaport, Wireless Communications: Principles and Practice (2007).

[13] *See* ATT-VZWG00000332-ATT-VZWG00000333 (setting forth assumptions underlying capacity gain estimates).

user bursty traffic conditions and assuming a 50 percent load (where load is defined as the resource block utilization level), a 10x10 MHz deployment is expected to support a median user throughput of about **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T HIGHLY CONFIDENTIAL INFORMATION]** Mbps compared to **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T HIGHLY CONFIDENTIAL INFORMATION]** Mbps for a 5x5 MHz deployment, for a relative gain of about **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION] [END AT&T HIGHLY CONFIDENTIAL INFORMATION]** percent.[14]

Finally, it is well known that the peak data rate for a 10x10 MHz block is twice that of a 5x5 MHz block.[15]

AT&T is providing documents supporting the analysis in this response.

3. REQUEST:

On page 1 of the Hogg Declaration, Mr. Hogg claims that AT&T is currently in the process of deploying its LTE network using Lower 700 MHz B Block, Lower 700 MHz C Block, and AWS-1 spectrum.

a. Discuss the extent to which the Company's base stations, antennas, and devices are capable of utilizing Lower 700 MHz B Block, Lower 700 MHz C Block, and AWS-1 spectrum. If all of the Company's current LTE network equipment and devices do not support all three spectrum bands, discuss whether and when all three spectrum bands would be fully supported.

[14] *See* ATT-VZWG00000340 (setting forth assumptions underlying calculations).

[15] *See, e.g.*, Eiko Seidel, Junaid Afzal, Günther Liebl, Nomor Research GmbH, *White Paper — Dual Cell HSDPA and its Future Evolution* at 2 (January 2009) (stating that doubling bandwidth will double data rates), *available at* http://www.nomor-research.com/uploads/1h/pA/1hpAccByjinAOWBDzTNt4w/WhitePaper_DC-HSDPA_2009-01.pdf.

RESPONSE:

AT&T's LTE handsets support LTE service in the Lower 700 MHz B Block, Lower 700 MHz C Block, and AWS-1 spectrum.

The base station antennas AT&T installs for its LTE services are capable of using the Lower 700 MHz B Block, Lower 700 MHz C Block, and AWS-1 spectrum. The LTE radio heads AT&T uses for Lower 700 MHz B and C Blocks support both spectrum blocks. Where AT&T already has deployed Lower 700 MHz C Block spectrum on a cell site, AT&T performs software configuration updates to add LTE service using Lower 700 MHz B Block spectrum. After the spectrum is added, some optimization adjustments to the antenna may be required to maximize performance.

Deploying LTE with AWS-1 spectrum requires a different radio head than is used for the Lower 700 MHz B and C Blocks, as well as other additional hardware and software.

b. For each relevant market, identify whether the Company has deployed LTE. If yes, identify the spectrum band, and the total amount of spectrum used for LTE deployment.

RESPONSE:

Exhibits 1 and 5.6-5.9 contain information responsive to this Request. For each Subject CMA, column D of Exhibit 1 shows the total population covered by LTE, and Exhibits 5.6-5.9 indicate the amount of spectrum deployed for LTE.

c. For each relevant market, discuss any changes to the Company's deployment of LTE as a result of the Proposed Transaction, including but not limited to, increasing total spectrum deployed or altering the spectrum band to be used.

RESPONSE:

See the narrative response to Request No. 1.

4. REQUEST:

On page 1 of the Hogg Declaration, Mr. Hogg states that "AT&T believes it can deploy the Subject Spectrum within approximately 60-90 days in markets where AT&T already provides LTE service in the Lower 700 MHz C Block, representing approximately 80% for the total population in the areas where AT&T is acquiring spectrum."

a. Identify the relevant markets where the Company would be able to deploy the spectrum it would acquire in the Proposed Transaction in 60 to 90 days. Provide a detailed explanation of the steps the Company would need to take to deploy the spectrum that it would acquire in the Proposed Transaction in 60 to 90 days.

RESPONSE:

As of February 5, 2013, AT&T provided LTE service using the Lower 700 MHz C Block within 13 of the Subject CMAs and, accordingly, projected that, within approximately 60-90 days after the effective date of the short-term spectrum manager leases, it could deploy the Subject Spectrum to the population then covered by AT&T's LTE service. The CMAs included in AT&T's February 5, 2013 projection are: CMA002 (Los Angeles, CA); CMA003 (Chicago, IL); CMA012 (Miami, FL); CMA023 (Cincinnati, OH); CMA034 (Rochester, NY); CMA036 (Memphis, TN); CMA045 (Oklahoma City, OK); CMA047 (Greensboro, NC); CMA061 (Charlotte, NC); CMA071 (Raleigh-Durham, NC); CMA072 (West Palm Beach, FL); CMA194 (Waco, TX); and CMA211 (Bradenton, FL). As discussed above in the response to Request No. 1, AT&T has fulfilled this projection by deploying the Lower 700 MHz B Block in these

areas, pursuant to the short-term spectrum leases with Verizon Wireless.[16]

Because AT&T had already deployed LTE service using the Lower 700 MHz C Block spectrum, and because AT&T radio heads supporting that block of spectrum also support Lower 700 MHz B Block spectrum, deploying LTE in these areas was achieved within 90 days of the effective date of the short-term spectrum manager leases by adjustments to existing equipment, including frequency and bandwidth tuning, software configuration updates, and optimization adjustments to the antenna, which were validated for commercial service by drive testing.

b. Identify the relevant markets where the Company holds but has not deployed its 700 MHz C Block spectrum, and provide a detailed explanation of the steps the Company would need to take to deploy the Lower 700 MHz B Block spectrum in these markets.

c. For any relevant market where the Company does not hold Lower 700 MHz C Block spectrum, provide a detailed explanation of the steps the Company would need to take to deploy the Lower 700 MHz B Block spectrum.

RESPONSE:

Exhibit 5.8 indicates the Subject CMAs where AT&T holds but has not yet deployed its 700 MHz C Block spectrum. Column F of Exhibit 1 indicates the projected LTE deployment dates for the Lower 700 MHz B Block in the Subject CMAs in which AT&T holds but has not deployed its Lower 700 MHz C Block spectrum or in which AT&T does not hold Lower 700 MHz C Block spectrum, to the extent those plans have been formulated to date.[17] As indicated

[16] Moreover, pursuant to the short-term spectrum manager leases with Verizon Wireless, AT&T also has deployed LTE service in the following additional Subject CMAs as of June 14, 2013: CMA066 (Youngstown, OH); CMA210 (Fort Collins-Loveland, CO); and CMA240 (Texarkana, TX-AR).

[17] As noted above in the response to Request No. 1, the projected deployment dates and forecasted population coverage in Exhibit 1 represent AT&T's current plans for LTE service in the Subject CMAs. These projections may change based on a range of factors that could affect

in the response to Request No. 1, the Subject Spectrum will be used for AT&T's initial LTE deployment or to augment AT&T's initial deployment. AT&T will follow its routine procedures for initial 700 MHz LTE deployments in these instances. These include, among other things:

[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]

[END AT&T HIGHLY CONFIDENTIAL INFORMATION] See also the responses to Request Nos. 1 and 4.a.

d. Provide all supporting materials relied on in preparing the responses in 4a. through 4c.

RESPONSE:

AT&T is submitting documents relied upon in preparing the responses to Request Nos. 4.a-4.c.

5. REQUEST:

Provide a list, in csv format, as of the date of this Request, for each relevant market,

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the LTE deployment schedule, including changes in zoning, leasing, equipment vendors, and other factors.

for each county within each state of each spectrum license that can be used in the provision of mobile wireless services that the Company holds, has a joint venture or other business arrangement with regard to, leases from another person, has another interest in, manages, has contracted to acquire, or is in negotiations to acquire. For each license, identify the: (a) FIPS Code; (b) county; (c) state; (d) market name; (e) market number (in the case of CMA, MSA, MTA, or BTA); (f) spectrum type; (g) spectrum block; (h) amount of spectrum; (i) the wireless technology format deployed or planned (e.g., GSM, EDGE, CDMA, EVDO, EVDO Rev. A, UMTS, HSPA, HSPA+, LTE); and (j) whether the Company: (i) holds; (ii) has a joint venture or other business arrangement with regard to; (iii) leases to or from another person; (iv) has an interest in; (v) manages; (vi) has contracted to acquire; (vii) is in negotiations to acquire; or (viii) plans to sell.

RESPONSE:

AT&T is providing csv files as Exhibits 5.1-5.9.

Using information from an FCC license database that AT&T keeps in the ordinary course of business, AT&T is providing Exhibit 5.1, which lists each spectrum license that can be used in the provision of mobile wireless services in which AT&T holds/has an interest in the Subject CMAs. AT&T understands "used in the provision of mobile services" to have the same meaning as "included in the spectrum screen."[18] AT&T interprets "hold" to mean having a direct or indirect interest of 10 percent or more. Exhibit 5.1 also contains information on the spectrum that AT&T is leasing to others.

Exhibit 5.2 lists each spectrum license that can be used in the provision of mobile wireless services with regard to which AT&T has a joint venture or other business arrangement. As of the date of this request, AT&T has a joint operating agreement with the local exchange carrier listed in Exhibit 5.2. For a description of this agreement, see ULS File No. 0005567075, Exhibit 1, at 1-2 (consented to Jun. 14, 2013).

[18] Accordingly, AT&T's WCS C and D block spectrum holdings are not included in this response.

Exhibit 5.3 lists each spectrum license that can be used in the provision of mobile wireless services that AT&T leases from another person in the relevant area.

Exhibit 5.4 lists each spectrum license that can be used in the provision of mobile wireless services that AT&T has contracted to acquire in the relevant area.

Exhibit 5.5 lists each spectrum license that can be used in the provision of mobile wireless services that AT&T is in negotiations to acquire in the relevant area. AT&T is engaged from time to time in discussions with other holders of spectrum licenses that may result in AT&T acquiring control of such spectrum licenses. **[BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION]**

[END AT&T HIGHLY CONFIDENTIAL INFORMATION]

AT&T does not manage any spectrum license that can be used in the provision of mobile wireless services that is not otherwise listed in Exhibit 5.1.

Exhibits 5.6-5.9 provide wireless technology format data. This information was compiled from **[BEGIN AT&T CONFIDENTIAL INFORMATION]**

[**END AT&T CONFIDENTIAL INFORMATION**] [**BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION**]

[**END AT&T HIGHLY CONFIDENTIAL INFORMATION**]

Where spectrum is summarized by CMA, POPs are summarized for the licensed area in question and the CMA market as a whole. In some cases the licensed area in question is smaller than the entire CMA. **[BEGIN AT&T CONFIDENTIAL INFORMATION]**

[END AT&T CONFIDENTIAL INFORMATION]

[19] [**BEGIN AT&T HIGHLY CONFIDENTIAL INFORMATION**] [**END AT&T HIGHLY CONFIDENTIAL INFORMATION**]

Exhibit 1

In Response to Request 1

REDACTED

[Exhibit 1 is redacted in its entirety as Highly Confidential Information]